

CLAIMS

We claim:

1. A method of increasing the yield of an aromatic carboxylic acid from a host cell producing said aromatic carboxylic acid comprising:
 - a) providing a host cell which:
 - i) produces an aromatic carboxylic acid; and
 - ii) comprises at least one *yhcQ* gene and at least one *yhcP* gene; and
 - b) up-regulating the expression of the at least one *yhcQ* gene and the at least one *yhcP* gene whereby the yield of aromatic carboxylic acid is increased.
- 15 2. A method for increasing the resistance of a host cell to aromatic carboxylic acids comprising:
 - a) providing a host cell which comprises at least one *yhcQ* gene and at least one *yhcP* gene; and
 - b) up-regulating the expression of the at least one *yhcQ* gene and the at least one *yhcP* gene whereby the host cell resistance to aromatic carboxylic acids is increased.
- 25 3. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcQ* gene and the at least one *yhcP* gene are endogenous to said host cell.
4. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcQ* gene and the at least one *yhcP* gene are heterologous to said host cell.
- 30 5. A method according to either Claim 1 or Claim 2 wherein the host cell is selected from the group consisting of bacteria, yeast, fungi and plants.
- 35 6. A method according to Claim 5 wherein the host cell is an enteric bacteria.

7. A method according to claim 5 wherein the host cell is selected from the group of genera consisting of *Escherichia*, *Salmonella*, *Bacillus*, *Acinetobacter*, *Streptomyces*, *Methylobacter*, *Rhodococcus*, *Corynebacterium*, *Pseudomonas*, *Rhodobacter*, and *Synechocystis*.

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8. A method according to either Claim 1 or Claim 2 wherein the aromatic carboxylic acid is selected from the group consisting of para-hydroxybenzoic acid, para-hydroxycinnamic acid, cinnamic acid, salicylic acid, benzoic acid, and 1-napthoic acid.

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9. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcQ* gene and the at least one *yhcP* gene comprise at least one suitable promoter operably linked to at least one isolated nucleic acid molecule selected from the group consisting of SEQ ID NO:1 – 4.

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10. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcP* gene comprises a suitable promoter operably linked to an isolated nucleic acid molecule encoding the amino acid sequence as set forth in SEQ ID NO:5.

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11. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcQ* gene and the at least one *yhcP* gene are expressed on a multicopy plasmid.

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12. A method according to either Claim 1 or Claim 2 wherein the at least one *yhcQ* gene and the at least one *yhcP* gene are under the control of a strong promoter.

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13. A method according to Claim 12 wherein the strong promoter is selected from the group consisting of *lac*, *trp*, *IP_L*, *IP_R*, *T7*, *tac*, and *trc*.

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14. A chimeric gene encoding an efflux protein comprising:

a) an isolated nucleic acid molecule having a nucleic acid sequence selected from the group consisting of:

- i) an isolated nucleic acid molecule selected from the group consisting of SEQ ID NO:1-4; and
- ii) an isolated nucleic acid molecule, wherein said isolated nucleic acid molecule hybridizes with (i) under the following

conditions: 0.1×SSC, 0.1% SDS at 65°C and washed with 2×SSC, 0.1% SDS followed by a second wash in 0.2×SSC, 0.1% SDS; and

- 5 b) a promoter;
wherein the promoter is heterologous to the isolated nucleic acid molecule.